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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,179	03/31/2004	Kenzo Fukuyoshi	1186.1034	5845

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EXAMINER
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MACCHIAROLO, PETER J

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/813,179

Applicant(s)

FUKUYOSHI ET AL.

Examiner

Peter J. Macchiarolo

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 18-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/31/2004</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 03/31/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

3. Figures 1a and 1b should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**4. Claims 11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

5. Claims 11 and 12 recite, “a thickness T1 of a portion of the colored lower layer” and “a thickness T of the colored lower layer.” The Examiner cannot glean from the disclosure which thicknesses are intended to be quantified as recited in the claims. Therefore, no reasonable prior art rejection can be made.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**6. Claims 1, 2, 5, 13, and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant cited Naito (JP 5048057; “Naito”).**

7. Regarding claims 1 and 2, Naito shows in figure 1, a solid-state imaging device comprising a plurality of two-dimensionally arranged photo diodes (2) and a plurality of microlenses having substantially hemispherical shapes which cover the respective photo diodes, the microlens comprising a multilayer structure lens including at least a transparent resin upper

layer (5) which forms at least a portion of the substantially hemispherical shape, and a colored lower layer (4) provided on a portion of the transparent resin upper layer, which is located above the photo diode, with a flat interface between the colored lower layer and the transparent resin upper layer having a shape conforming to a surface of the photo diode.

8. Regarding claim 5, Naito shows in figure 1 the plurality of colored lower layers have the same thickness, thereby the difference is not more than 0.3  $\mu\text{m}$ .

9. Regarding claim 13, Naito discloses the resin used for the transparent upper layer is a fluorine-based acrylic resin, which has a material property of not more than 40% transmittance at an exposure wavelength and a transmittance of not less than 90% in a visible range, as evidenced by Applicant at [0104].

10. Regarding claim 17, Naito discloses the device comprises a non-opening portion layers (7) which cover non-opening areas (gap) existing between the plurality of microlenses, and in which at least one of the transparent resin upper layer and the thin film is made of a fluorine-based acrylic resin [0016].

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**11. Claims 3, 10, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito in view of Applicant cited Ohashi (JP6132505; "Ohashi").**

12. Regarding claims 3 and 10, Naito is silent to the portion of the colored lower layer forming at least a portion of the substantially hemispherical shape.

13. However, Ohashi shows this configuration (26) when applied in matrix form allows for a lens gap which increases the overall durability of the device and reduces crosstalk.

14. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Naito's lenses with Ohashi's colored lower layer forming at least a portion of the substantially hemispherical shape to allow for increased durability and reduced crosstalk.

15. Regarding claim 14, Naito and Ohashi are silent to the refractive indices of the upper layer and the colored lower layer.

16. However, one of ordinary skill in the art will arrive a configuration that includes the upper layer having a refractive index less than the colored lower layer to allow for a greater critical angle of incidence for incoming light, which in turn increases the device's overall sensitivity.

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17. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Naito and Ohashi with the upper layer having a refractive index less than the colored lower layer.

18. Regarding claim 15, Naito shows an outer resin layer (7) which has a lower refractive index than the lens layer (5).

19. Naito is silent to the refractive index of the outer layer being less than the colored lower layer, or the colored lower layer forms a portion of the substantially hemispherical shape.

20. However, as discussed above, Ohashi shows the colored lower layer, which forms at least a portion of the substantially hemispherical shape.

21. Furthermore, the refractive index of the outer resin layer being smaller than the lower colored layer is obvious for the same reasons as discussed in rejected claim 14.

22. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Naito and Ohashi with the refractive index of the outer layer being less than the colored lower layer, and the colored lower layer forms a portion of the substantially hemispherical shape.

23. Regarding claim 16, Naito discloses the transparent resin upper layer comprises a fluorine-based acrylic resin.

**24. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito.**

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25. Regarding claim 4, Naito is silent to the specifics of the color filter.

26. However, the Examiner takes official notice that a color filter is known in the art to comprise a colored resin layer containing a dye as a coloring material.

27. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Naito's color filter as a resin layer containing a dye as a coloring material.

28. Regarding claims 6, the limitations herein have been discussed at rejected claim 14 above.

29. **Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naito in view of Applicant cited Nakano et al (JP 2000193819; "Nakano").**

30. Regarding claim 7, Naito shows in figure 1, the device further comprises a planarized layer (3) provided between the microlens and the photodiode.

31. Naito is silent to at least one of the microlens and the planarized layer has an infrared absorbing function.

32. However, Nakano teaches that the addition of an infrared absorbing layer (13a) allows for increased visible ray transmitting rate and transparency.

33. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Naito's device with an IR absorbing layer to increase the visible ray transmitting rate and increase transparency.



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**34. Claim 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naito in view of Nakano in further view of Applicant cited Matsumoto et al (JP 5326902; "Matsumoto").**

35. Regarding claims 8 and 9, Naito and Nakano are silent to the planarized layer having an ultraviolet absorbing function.

36. However, Matsumoto teaches this configuration allows for an increased image uniformity and reduced crosstalk occurrence.

37. Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Naito with the planarized layer of Matsumoto to increase image uniformity and reduce crosstalk.

### *Conclusion*

38. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375. The examiner can normally be reached on 8:30 - 5:00, M-F.


40. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

41. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pjm



**JOSEPH WILLIAMS**  
**PRIMARY EXAMINER**